Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Optical defect detection of semiconductor thin film by sub-micron resolution second harmonic technique FARBOD SHAFIEI, The University of Texas at Austin, TOMMASO ORZALI[1], ALEXEY VERT, P Y HUNG, MAN HOI WONG[2], GENNADI BERSUKER[3], SEMATECH, MICHAEL DOWNER, The University of Texas at Austin — Epitaxial semiconductor III-V film such as GaAs or InP are strong candidate for electron transport and opto-electronic devices due to higher mobility of carriers in these films. Growth of such polar materials over mismatch and nonpolar substrate such as Si leave us with variety of defects such as treading dislocation. As these defects act as sink for charge carriers and scattering point for mobile charges, detection and control of such a defects became very important for semiconductor community. For the first time a noninvasive nonlinear optical technique has been used to map the localization of the light by these defects. A nonlinear nearfield scanning optical microscope (NSOM) is used to reveal the hotspot looking localization of the light due to presence of the defects. Films with variety of dislocation defects density has been studied which their nonlinear second harmonic optical maps distinguish such a defect density.

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Date submitted: 11 Nov 2016 Electronic form version 1.4